# DIVULSION IN ŒSOPHAGEAL STRICTURES BY MEANS OF A NEW INSTRUMENT.

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In the February number of the ANNALS OF SURGERY, 1904, there appeared an article by Dr. Rilus Eastman, upon the treatment by direct dilatation of cicatricial œsophageal stricture.

In substance, bearing in mind the extreme variability of the anatomical conditions resulting from wounds or burns or other processes that finally bring about a stenosis of the œsophagus, variability either in the displacement of the lumen, or in the extension of the strictured part, or in the irregularity of the stenosed passage, he recognizes how badly the ordinary olive-pointed dilator answers in certain cases, since the position in the gullet of the olive-pointed dilator of a hard-rubber olivary bulb (page 166) attached to a springy whalebone shank cannot be controlled by the operator. (*Treatment by direct dilatation of cicatricial œsophageal stricture,* ANNALS OF SURGERY, February, 1904.)

The same objections may be made to the spiral metallic sound of Cracour and to dilators of woven tissue or of caoutchouc. Especially if the stricture has a valvular form and disposition—and examples of this are not wanting—is it extremely difficult to pass the stricture and to proceed with the gradual dilatation by the ordinary method.

He therefore proposes to use, and has used with success, elastic, malleable sounds formed with thin, smooth, metallic spirals or of web-silk containing withdrawable lead core.

By curving the extremities in various ways, we can with these sounds experimentally pass a stricture, just as is often done in strictures of the urethra, by means of filiforms whose

points can be variously bent or twisted into spiral or corkscrew form.

And the comparison is the more exact as the author proposes in certain cases to screw the extremities of an ordinary metallic œsophageal sound to the head of his special filiform sound, and so push it into the stomach, passing the stricture precisely as we do with the filiforms and with the divulsors or urethrotomes in urethral strictures.

And the author has also constructed a dirigible metallic sound whose point can be turned at will by means of a screw which is in the handle, almost as we turn the lever in the cystoscope with the urethral catheter, and can then be guided after various attempts to pass an œsophageal stenosis.

It is, however, easy to understand that this instrument must be of much less practical utility than the first described filiform sound.

When this article appeared, I had under my care at the Hospital of San Giacomo a patient, whose history I shall relate later on, suffering from severe and extended œsophageal stenoses impassable by the ordinary sounds or the olive-pointed dilators, which fact had already made me design and employ a new instrument.

I agree with Dr. Eastman that the only way to overcome the stenosis in these cases is by means of very fine ductile sounds, whose extremities can be directed in various ways, and when used by a practised and careful hand, trying, I would almost say, testing, the œsophageal walls in their different segments, they may succeed in threading the restricted and often decentralized passage, or in overcoming the valvular formations that arrest the ordinary sounds.

As a rule, we do not act otherwise in the case of stenosis of the urethra, and the resemblance is obvious, making allowance for the greater difficulty of manipulation in the œsophagus.

And this purpose, I agree with the author, may very well be answered by the filiforms he proposes, whether metallic or elastic, with lead core or not.

But also ordinary whalebone filiforms with varying points

will answer very well, especially with a very small metallic terminal olive screwed to the end of a little metallic ring, precisely as is done in manipulations with the urethra, when often, after repeated attempts and sometimes after several sittings, of course always careful and cautious, we at last succeed in overcoming a stenosis that resists other ordinary olive-fitted sounds.

But yet to succeed in passing with a thin whalebone string, or with a filiform sound, as proposed by Dr. Eastman, is often less than nothing, since the success is not easily repeated, nor can it be followed up with a thicker sound, and the treatment is not advanced a step.

But the filiform introduced may serve as a guide precisely as happens in the case of the urethra, and as in the latter, so in the case of the œsophagus, one could slip in either hollow elastic sounds open at the end like those of Patamia for the bladder, or, as Dr. Eastman suggests, screw a spiral metallic sound on to the end of the filiform, and, driving this into the stomach, pass the stricture with a thicker sound, or finally use filiforms to conduct one of the recognized cutting instruments across the strictured point.

The first two means are often difficult to employ, and when forced may become dangerous. We know this in the case of the urethra, where the manipulation is more external, more easy, and is controlled both by the eye and the fingers.

The so-called internal œsophagotomy is an operation which, since 1861, when Maisonneuve boldly practised it for the first time with his instrument, although not very frequently used, is found described and accepted in all treatises of operative surgery. Maisonneuve's instrument is of construction similar to his urethrotome (only naturally it is longer and somewhat thicker), is provided with a conductor, and cuts from above downward, with a blade of triangular anterior point and two sharp sides. It gives no certainty of the depth of incision, and, further, in a case of partial stenosis, may cut also on the other side, producing unnecessary lesions. For the same reason we must reject the "anterograde" œsophagotome of Lannelongue, which also cuts downward; the author used it with good success in one case.

That of Dolbeau, on the other hand, cuts upward, and is constructed with a terminal sphere ending in a conical point, the sphere being six millimetres at the base, and the two blades cutting laterally; the blades are made to open by means of a mechanism in the handle; as soon as the olive which covers them has passed the stricture and in drawing up they are arrested on the strictured point; the opening of the blade is in proportion to the diameter of the sphere, therefore all danger of cutting too deep is excluded.

More in use (Trélat, Tillaux) is the Trélat œsophagotome; and even nowadays it is recommended in preference to others (see Monod and Wanwärts). It is made with a curved rod having an inverted olive at the end, that has to pass across the strictured point, surmounted by an enlarged part that touches and stops on the stricture itself. In the terminal portion there are two sheathed blades as in the hysterotome of Weber, which, by means of a screw in the handle of the instrument, can be made to open, while the extent of the opening can be graduated according to a little index near the screw from one to twenty millimetres in length.

In using this instrument, it is recommended, first, to determine the distance of the strictured point from the incision by means of an ordinary olive-fitted sound, and, having marked this point on the rod of the instrument, introduce it as far as the point marked, pass the stricture, turn the screw, opening the blades more or less according to the circumstances, draw the instrument up some centimetres, close the blades by turning the screw in the opposite direction, and withdraw the whole instrument.

In this way it is said the stricture is cut from below upward with precision to the depth required, and in the exact point predetermined.

But it is first of all necessary that the terminal olive part can pass the stricture, and when this is possible, we could do without the œsophagotome; and it is also necessary that the stricture be only one and small; and even in these cases all inconvenience is not excluded, since, when used by Trélat himself

with an opening of the blades of twenty millimetres, a serious hæmorrhage occurred (*Gaz. des Hôp.*, 1870, p. 115). Studsgaard used an instrument fifty centimetres long, which carried an elastic conducting sound with a button at the end and a cutter within a pair of steel tongs, out of which it could glide, this cutter measuring one centimetre in diameter at its greatest breadth.

Czerny used an œsophagotome constituted on the model of Ivanduch's urethrotome, only longer. The instrument was introduced closed, and the stricture was cut from below upward, the cutting blade extending about two millimetres from the sheath.

Sands also proposed a new œsophagotome constructed after the type of the urethrotome. To obtain both the incision and the dilatation from the strictured point, the blades are hidden in split olives. The stem of the instrument is formed of a hollow spiral, through which run two thin metal threads connected with the blades; these by a movement of a screw leave the olive, while an indicator gives the depth of the incision. A movable ring on the rod serves to mark the distance of the stricture from the incisors.

Le Dentu, who thought the instrument of Trélat useful, when it could be used, in a case of his, in which the contraction was too narrow to admit Trélat's conductor, reverted to the double-bladed œsophagotome of Maisonneuve, the comparatively thin conductor of which can pass into an œsophagus where No. 11 or 12 urethral sounds could pass.

Yet he says textually, "avec ses lames formidables c'est un instrument dangereuse qui a fait ses preuves dans se sens." He modified it, therefore, preparing six blades, graduated in three pairs, five, seven, and nine millimetres in width, so that combining them differently he could obtain incisions of from twelve to twenty-one millimetres.

He used it in a case in which the stricture had extended far, and could only be passed by a urethral sound, No. 11; Trélat's instrument he could not use. With his own instru-

ment he was able first to make an incision with two blades, No. 1, and then with one blade, No. 1, and one No. 4.

Then the invalid, who was wilful, insisted on leaving the hospital, and we know no more about him. The success, therefore, remains incomplete.

Schlitz has an instrument that was used by him in three cases with success, and in two others by Kölliker (see Weber). It is a hard gutta-percha tube with one of the usual hollow sounds, sixty-eight centimetres long and twenty millimetres in circumference, with its lower extremity blunt, girt three centimetres above this point with a metallic sheath, split lengthwise, from whose cleft the knife issues when required. The knife is moved by the hand working a metal thread that passes inside the sound, and at will the knife is made to escape from its sheath and return into it. It is governed by means of a screw that lengthens and shortens the metal thread, and so causes the knife fixed at the end to issue more or less from its groove. Besides this, the external extremity of the sound has an eye that stands in the longitudinal axis of the instrument, and is always on the side opposite the blade at the other extremity of the sound; so the operator may know in what direction the incision is being made. The greatest distance that can be obtained between the point of the blade and the axis of the instrument, by means of the screw, is seventeen millimetres. This œsophagotome is used in the "retrograde" way (cutting on withdrawal). When, therefore, the sheath with the cutter is passed across the stricture, the screw is turned for the exit of the blade to the extent desired, and the instrument cuts as it is drawn up. For further particulars, Weber's article should be consulted. But it is not of great importance.

The important thing is that these are all dangerous instruments, especially, and all agree in this, those that cut downward, even when guided as Maisonneuve's and Lannelongue's, and also that modified by Le Dentu, and therefore almost everybody rejects them. Monod and Wanwärts include Reybaud's instruments among the dangerous ones.

The so-called "retrograde" instruments have the initial

and formidable defect that the restriction must be penetrable by instruments of a certain diameter. Trélat's has four millimetres diameter in its narrowest terminal portion, Sehlitz's has six and a half. And then they are dangerous. In a case of Trélat's own, and in one of Sehlitz's, there was hæmorrhage after the operation, and in a case of Czerny's there was death. Besides, as I have said, if in a case of stricture you can pass an olive-fitted sound of four or six millimetres, we may say such a case is absolutely exceptional, if one could not succeed as well by gradual dilatation, which is naturally far preferable to all other methods in the treatment of œsophageal stenosis.

There are some cases, as I hinted at in the beginning, that only allow the passage of filiforms, and these not easily and not always; so that it is not possible to pass every day and effect a regular progressive dilatation; and for this it is often necessary to try over and over again, and to use fine whalebone sounds, bending them in various ways, and resorting to artifices; and in these cases, when we have once passed, there immediately arises the necessity and the desire that this laboriously obtained result shall not become useless through the withdrawing of the sounds, which who knows when we shall succeed in reintroducing; and it is rather desirable to use them as a guide to obtain a rapid dilatation that may permit of the entrance of thicker sounds so as to continue then the daily dilatation with less difficulty with the ordinary sounds.

Durante, several years ago, for a case of this kind, designed a special olived œsophagotome, cutting from above downward and guided by whalebone strings. The instrument consists of a thin whalebone guide (Fig. 1), the extremity of which is provided with a little metallic olive, not more than one or two millimetres in diameter, and whose length must be great enough to allow of a second string being screwed on to the first with a little metallic ring. When the guide has been introduced across the stricture, the essential part of the instrument slips on to it, consisting of a conical metallic olive, whose greatest diameter is from six to eight millimetres, furnished with three embedded cutters like those of Maisonneuve's instru-

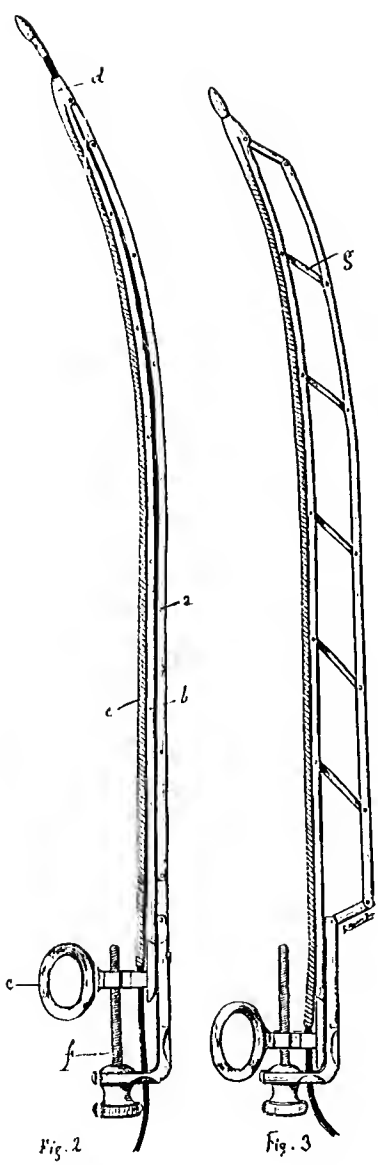


Fig. 2 Fig. 3

The œsophageal divulser of Alessandri.

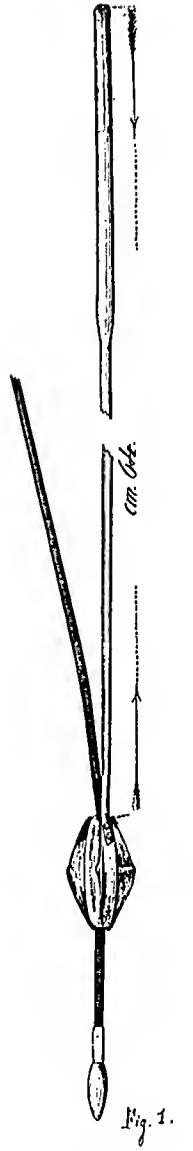


Fig. 1.

The œsophagotome of Durante.

ment, but smaller, and only from three to four millimetres when at their extreme height. The olive is fixed on a thin flexible metallic stem, and is pierced down the middle so as to be threaded on the guide and pressed down upon it by means of the flexible metallic handle as far as the strictured point that it is forced to pass, partly tearing and partly cutting it.

In two cases Durante applied it with success. In a case that came under my care last winter, in my department of the Hospital of San Giacomo, I wondered if I could not with greater safety have recourse to an œsophageal divulsor, in the same manner as is daily done for the urethra. Here also we must recognize the difference of opinions in favor of the urethrotome or of divulsion.

It is certain that divulsion gives excellent results, provided one does not try to get too large a dilatation at first, which may cause laceration and infiltrations, and which, above all, is not necessary, because a moderate divulsion is enough to allow of the subsequent easy passage of sounds, gradually increasing in thickness and the safe reaching of the degree of dilatation desired.

I do not see why we should not try to obtain the same results in the case of the œsophagus. Yet divulsions in the case of œsophageal stricture is never mentioned in treatises of surgery or in special memoirs, or if spoken of is rejected.

Albert says it is an operation so dangerous that it has justly found no advocate. He says we may have laceration of the œsophagus or necrosis even of small points with consequent ichorous infiltration. And he mentions the figures of the dilators of Le Fort and Demarquay, which have the very great fundamental defect of the retrograde œsophagotomes abovementioned, that is, they are not guided, and have such a diameter that they cannot pass across a severe, extended, or irregular stenosis without danger, and for such stenosis, where they can pass, the same Albert's observation is justified that equally good results can be obtained by gradual pressure of a conical sound.

König mentions and gives figures of Fletcher's dilator, which has three arms, varying according as a button that is

placed between them is pulled; and also he mentions a parallel dilating sound of Selützenbergh and a pineette with branches, that open parallel to each other, of Broca.

v. Haeker mentions the instruments of Collin, Vidal, and Leube. He also describes those of Jameson, Bruns, and Svitzer, which, however, are only artifices for a graduated dilatation, and cannot be called divulsors. They are modifications of the ordinary olive and crescent dilator of Tillaux.

That of Jameson (see figure in König) is formed of a whalebone rod, bearing an ivory olive at its extremity. The olive is pierced lengthwise to allow the passage of a little metallic rod with a button, this rod serving as guide. Rather than a divulsor, it is a guided olive dilator.

That of Bruns (figure in König) is the same in conception. Upon a guide three millimetres in thickness, on to which a little ivory sphere of five millimetres can be screwed, guides are driven by means of a threaded sound, or wedges of ivory of various sizes with a special propeller and two threads are fixed to them to withdraw them after having left them for a long time. Instead of the guides, we can use silk thread, to which a little sphere is attached, that the patient swallows, and which passes the strictured point.

Svitzer in the same way passed the strictures with ivory olives fixed to a thread, introduced by means of a whalebone sound that was fastened in the hollow of an olive, and then with a twist movement freed itself, and was withdrawn, and the patient then by drawing a thread could extract the olive.

In the same way, but with the object of maintaining it there for a greater or less length of time, and so assure nutrition, small cannulas are introduced fixed to threads, so completing a kind of intubation.

As is seen, all these are means that differ little from the ordinary graduated dilatation by means of sounds or olives, or are modifications of it, and they are more or less successful artifices.

Senator with a sound introduces a little cylinder of laminaria attached to a thread and leaves it for more or less time,

at the most an hour; but the strength of the dilatation cannot be controlled.

Schreiber fixes a little tube of caoutchouc, hermetically sealed with sealing-wax, on a whalebone filiform, projecting from an œsophageal sound, to which it is also fixed. When it is in the strictured part, tepid water is introduced, and the tube is distended and the strictured passage can be widened. Reichman and Russell use similar instruments, however, with air pumped in instead of with water.

As von Hacker observes, the minimum of diameter of the instruments is, however, three millimetres; and so they do not serve for very severe strictures.

As a sample of general opinion we can refer to that of Albert, who, after having equally rejected divulsion and internal œsophagotomy, says that the safest process is with external œsophagotomy and gastrostomy.

But the laceration and neurosis he fears in divulsion may arise only if one pushes down the instrument blindly, and if in the divulsion we exaggerate and try to obtain at once an advanced dilatation.

Of course, these dangers are not smaller with any kind of œsophagotomes. Several of them dilate beside cutting, and the incisions may often give rise to serious hæmorrhages (as in the case of Trélat and Schlitz); nor do we often know in what direction the incision or incisions will occur, and even in those instruments, such as those of Schlitz, in which this is indicated, we gain very little when we consider we do not know in what part the cicatrization of the œsophageal wall is thickest.

External œsophagotomy answers well in certain special cases, always in the cervical region, for no one thinks of practising intrathoracic œsophagotomy for simple stenosis.

As to gastrostomy, there is universal agreement that it is necessary in certain cases where the stricture is not passable, and it is imperative to nourish the patient, that his general conditions of health may be sustained.

It will be then in these cases an excellent preparatory

operation, since it only serves to permit tranquil manipulation and to increase the hope of success in passing the lateral stricture, and then closing the gastric fistula.

Or it may serve for retrograde catheterism, and certainly this is a method that has often given excellent results, when in no other way an œsophageal stenosis, especially a low placed one, could be passed. I do not wish here to enter upon the subject of retrograde catheterism, which would take us too far from our subject, and which, any way, is certainly a process to be reserved for certain special cases.

In the case I have referred to, and of which I will now give in brief the clinical history, I did not find myself urged to gastrostomy, or to attempting retrograde catheterism, since, although, for many days, the stricture was not passable by even the finest sounds, and, above all, did not lend itself to a gradual regular dilatation, for although, one day, I did succeed in the insertion of a string, I did not succeed either in proceeding further in the same sitting, nor in the following days did I often succeed in re-introducing the same sound, yet, all the same, liquid passed, and nutrition went on sufficiently satisfactorily.

And therefore, while I deferred, if necessary, recourse to gastrostomy or to a trial of retrograde catheterism, I thought this was just the occasion to force the constricted part so as to permit the passage of gradually enlarged sounds.

I confess that I had no disposition to use any of the recognized œsophagotomes, nor yet that of Durante. The length and the irregularity of the constricted part, evident from the great difficulty in the introduction of a simple whalebone string, led me to believe that the cuttings would be uneven. and the œsophageal wall would be variously interested.

And all the dangers mentioned above of the various œsophagotomes of anterograde type—since there was no question of the retrograde—made me abstain from using them.

I devised and had constructed by Invernizzi, of Rome, an instrument of the type of the urethral divulsor of Oberlaender, of which there are two forms, an original and a new one, or

of the divulsor urethrotome of Otis. I give here the drawing and a summary description.

As is seen from the figure (Fig. 2), the instrument when closed consists of two flexible metallic bars (*a* and *b*) firmly joined together, and of a metallic spiral (*c*) which represents a pierced sound, all united at the extremity in a truncated conical point, also perforated (*d*). In the handle there is an eyelet (*e*) for the guidance of the instrument, and a screw (*f*) serving to separate the two bars, raising the inner one by straightening out the cross bars (*g*), which vary the distance of the bars according as desired.

Having passed the stricture with a whalebone filiform, such as may pass through the pierced extremity of the instrument, and preferably ending in a little metallic olive as in the guides of Durante's œsophagotome, over this (Fig. 2) the closed instrument is introduced, and arriving at the stricture is pressed gently but surely across it, since in this way it only acts as a guided conical sound. When the strictured point has been passed, the screw in the handle is turned and the bars are separated (Fig. 3), more or less, according as it is desired; it being observed that great force is not necessary, and that we may content ourselves with a slight divulsion, not dangerous, so that immediately, or in the following days, we may pass it with sounds of increased caliber. But this limitation is almost inherent in the instrument itself, since by its very curve and the direction in which the transverse bars rise, if the dilatation is exaggerated or if the resistance at the stenosed point is great, the separation of the bars will not take place, and the screw movement is counterbalanced by the increase of the curve of the whole instrument.

We may convince ourselves of this by forcibly pressing the extremity of the instrument while we turn the screw in the handle.

In the case in which I used this divulsor the manipulation was performed easily without any kind of inconvenience, either immediately or later on; and only on the day after the operation the passage of food, even liquid, was more difficult, and

the patient complained of a slight pain in the epigastrium; but after the second day swallowing was easy and the passage of the sounds possible, while, as I have said, it was before very difficult, and, above all, I found it easy gradually to increase the caliber of the sounds until we reached a sufficiently large dilatation, which was maintained, the sounds passing from time to time until the death of the patient two months after the operation, happening almost unexpectedly and from pulmonary lesion.

Another important feature to be emphasized in narrating this case of mine was the nature of the stricture. The sufferer, forty-two years of age, had been a hard drinker (especially of spirits), smoker, and an inveterate tobacco chewer.

There was never an ingestion of acids or hot liquids; there was no syphilis; there was, on the other hand, pulmonary tuberculosis, and the year before he had suffered an operation of gastro-enterostomy for pyloric stenosis.

Given the pulmonary tuberculosis, a specific stenosis might have been imagined. But the hardness of the stricture, the complete absence of any bleeding under repeated manipulation and attempts at soundings, the fact that the obstacle to the passage of liquids did not increase, and that the attempts could be continued for weeks, also excluding the idea of neoplasm, seemed to me convincing reasons to the contrary.

I may mention that Debove communicated to the Society of the Hospitals of Paris (August 12, 1887) (De l'ulcère simple de l'œsophage et de rétrecissement consecutif de cet organe. Gaz. litt. de med. et chir., 2 Sept., 1887), two cases in which he admitted stricture of the œsophagus following on simple ulcers altogether resembling those of the pylorus.

Basing his opinion on incomplete anatomical observations of Quincke, he attributed these strictures to simple ulcers. The first was dilated and cured; the second patient, on the other hand, died, and Debove says that the autopsy confirmed the opinion that there had been ulcer of the œsophagus analogous to gastric ulcers.

It is to be noted that Debove's patient had formerly had

hæmatemesis, and died from the perforation of a typically trophical gastric ulcer. On the œsophagus, five centimetres from the cardiac, he found a circular scar one-half centimetre deep, with some fibrous irradiations towards the upper and lower portions of the mucosa. The forefinger could pass over it easily. (The patient was catheterized daily for the last three years.) Above the strictured point the œsophagus was cleanly dilatated.

In the case under my observation, the absence of determining causes of stricture or ulcers of the œsophagus, the decisions I came to, as above set forth, as to the neoplastic or specific nature of the affection, the low position of the stenosis, the contemporaneous existence of pyloric stenosis, all made me think that here I had to do with a similar example to that of Debove.

CASE.—G. V., of Camerino, clerk, forty-two years old, entered the Hospital of San Giacomo, February 21, 1904, and was placed in my section at No. 22 (Ward Genza). (Descriptive No. 515.)

Nothing important as to heredity. He had been an obstinate drinker, smoker, and tobacco-chewer. He asserted he had only once had blennorrhagia. In the spring of 1903 he had violent pains in the gastric region, with fever, from which he got better under a treatment of dieting and medicaments. But in June the former troubles came on again, and just after swallowing food he used to be taken with violent efforts to vomit, which ended in ejection of the food, unless in liquid form; he had, besides, pain along the œsophagus during deglutition, also in the stomach immediately after his meals.

These symptoms grew more severe, the pain went on increasing, and became almost permanent.

With a diet rigorously liquid, alkalies and bismuth, he seemed to get better; but at any attempt to introduce any food not liquid the same troubles recommenced, in especial the efforts to vomit, the pain in the gastric region and pain also at a point in the back. He stated further that he had before this time and before taking any medicine (bismuth, for example) pitch-black excrement; on the other hand there had never been hæmatemesis.

He therefore entered the Hospital of San Giacomo in August, 1903, and was declared to be suffering from dilatation of the stomach. It was at a distance of two fingers' breadth above the navel, and there was pain upon pressure of the epigastric angle.

He was operated on September 1. He was found to have the stomach enlarged, pyloric stenosis, no neoplasma. He was operated by Doyen's gastro-enterostomia process.

He left the hospital cured October 11, 1903. He remained fairly well until December, always, however, observing a careful diet, when suddenly, and without dietetic disorder, he began again to have vomitings of his food, and not to be able to swallow more than a mouthful of liquid at a time through an impediment above the stomach that the patient localized in the epigastrium. He said if he swallowed four or five mouthfuls of liquid together he felt full up to the throat, almost suffocated, and, finally, was obliged to disgorge all. If, on the other hand, he drank small draughts at intervals, he felt the liquid gradually descend into the stomach, and then he had no further difficulty digesting perfectly. His motion was irregular and constipated.

When I tried to introduce an ordinary gastric sound it entered easily for some distance, and at a given point stopped at an insurmountable obstacle, about forty centimetres from the dental arch. With conical cylindrical olive-pointed œsophageal sounds I did not succeed in passing, nor yet with the smaller ones; only once I managed the passage with a sound of five millimetres caliber, and that only after repeated efforts; but in the same sitting, after the first had been removed, I could not proceed with sounds of increased caliber, nor in the following days was I able to reintroduce the same sound.

The passage of liquids was, however, possible, and the patient could nourish himself, swallowing by mouthfuls milk and broth. So I suspended the gastrostomy I had intended, and also any attempt at retrograde catheterism, and I constructed my instrument.

When I had it, for several days I could not use it, since I could not succeed in passing the stricture even with a whalebone olive-pointed filiform of two millimetres.

At last on April 4 I succeeded in introducing the filiform, and over this I soon brought the instrument, which with graduated efforts I succeeded in bringing past the strictured point;

afterwards I turned the screw to widen the arms and then withdrew all.

In the following days I easily introduced sounds of five millimetres and six millimetres, and in the sequel we succeeded in easily passing sounds of one centimetre and more, while the patient could swallow porridge (minestra) and minced meat. At the end of May the lung trouble from which the patient had suffered, grew worse. He died of this on June 4. At this time the œsophageal stricture had been sufficiently dilated, and the passage of the sounds was only made every three or four days.

We could not make the autopsy, through objections on the part of the family.

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